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(54) **Title:** DISPLAYING 3D CHARACTERS IN GAMING MACHINES
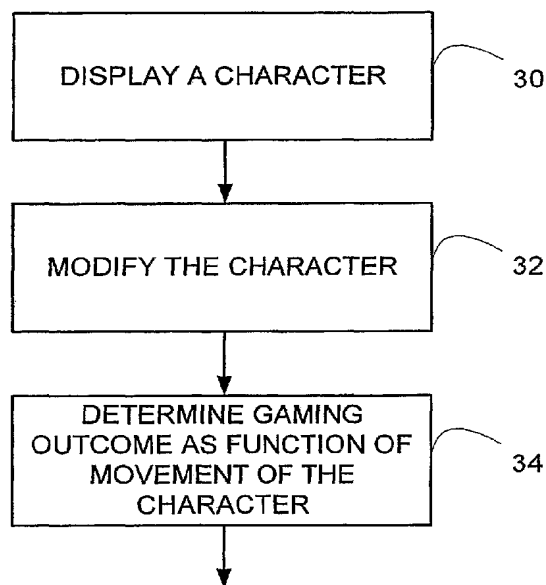
(57) **Abstract:** Embodiments of the invention include a method of performing a bonus event in a gaming machine that produces a gaming outcome. The method for performing a bonus event includes displaying a three-dimensional character; modifying the character based on one or more user selections; and controlling the character to influence the gaming outcome.

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DISPLAYING 3D CHARACTERS IN GAMING MACHINES

Related Application

5   This application claims the priority benefit of U.S. Provisional Application

Serial No. 60/615,216 filed October 1, 2004, the contents of which are incorporated

herein by reference.

Copyright

Background of the Invention

Field of the Invention

This patent application pertains generally to gaming systems, and more

20   particularly, but not by way of limitation, to a system and method for displaying

three-dimensional characters in a gaming machine.

Background Information

Video gaming machines are popular within the gaming industry. They

25   typically are operable to play traditional games such as slots, poker, bingo, keno and

blackjack. Such machines have been enhanced in recent years by adding effects that

make them more attractive, exciting and entertaining.

Effects for video games fall broadly into two categories: reel spin and bonus

events. Reel spin effects usually rely on visual changes within the image

30   representing the reel in a slot machine. Bonus events occur outside the reel spin,

injecting either a random event or fostering some player interaction to trigger a
random event.

The graphical capabilities of processors have increased dramatically over the
last decade. At the same time, there is a continuing need to develop new and
5   exciting effects for video gaming machines. What is needed is a way of harnessing
the graphics power of processors to introduce new and innovative features in video
gaming machines.

Brief Description of the Drawings

10   FIG. 1 illustrates a gaming machine according to the present invention;
FIG. 2 is a block diagram of a control system suitable for operating the gaming
machine of FIG. 1; and
FIGS. 3 and 4 illustrates methods of displaying and controlling three-dimensional
characters according to the present invention.

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Detailed Description of the Invention

In the following detailed description of the preferred embodiments, reference
is made to the accompanying drawings which form a part hereof, and in which is
shown by way of illustration specific embodiments in which the invention may be
20   practiced. It is to be understood that other embodiments may be utilized and
structural changes may be made without departing from the scope of the present
invention.

FIG. 1 illustrates an exemplary video gaming machine 10, also referred to as
a Video Lottery Terminal (VLT), in which embodiments of the invention may be
25   implemented. In some embodiments, gaming machine 10 is operable to conduct a
wagering game such as mechanical or video slots, poker, keno, bingo, or blackjack.
The gaming machine 10 shown in FIG. 1 includes a video display 12 such as a
cathode ray tube (CRT), liquid crystal display (LCD), plasma, or other type of video
display known in the art. In one such embodiment, a touch screen overlies the

display 12. In the illustrated embodiment, the gaming machine 10 is an "upright" version in which the display 12 is oriented vertically relative to a player. Alternatively, the gaming machine may be a "slant-top" version in which the display 12 is slanted at about a thirty-degree angle toward the player.

5   Gaming machine 10 includes one or more credit receiving mechanisms 14 for receiving credits to be used for placing wagers in the game. The credit receiving mechanisms 14 may, for example, include a coin acceptor, a bill acceptor, a ticket reader, and a card reader. The bill acceptor and the ticket reader may be combined into a single unit. The card reader may, for example, accept magnetic cards and 10   smart (chip) cards coded with money or designating an account containing money. In some embodiments, credit receiving mechanism 14 receives credits through a network interface.

          In some embodiments, the gaming machine 10 includes a user interface comprising a plurality of push-buttons 16, the above-noted touch screen, and other 15   possible devices. The plurality of push-buttons 16 may, for example, include one or more "bet" buttons for wagering, a "play" button for commencing play, a "collect" button for cashing out, a help" button for viewing a help screen, a "pay table" button for viewing the pay table(s), and a "call attendant" button for calling an attendant. Additional game specific buttons may be provided to facilitate play of the specific 20   game executed on the machine. The touch screen may define touch keys for implementing many of the same functions as the push-buttons. Other possible user interface devices include a keyboard and a pointing device such as a mouse or trackball.

          A processor controls operation of the gaming machine 10. In response to 25   receiving a wager and a command to initiate play, the processor randomly selects a game outcome from a plurality of possible outcomes and causes the display 12 to depict indicia representative of the selected game outcome. In the case of slots for example mechanical or simulated slot reels are rotated and stopped to place symbols on the reels in visual association with one or more pay lines. If the selected outcome

is one of the winning outcomes defined by a pay table, the processor awards the player with a number of credits associated with the winning outcome.

FIG. 2 is a block diagram of a control system suitable for operating the gaming machine 10. Money/credit detector 22 signals a processor 20 when a player

5   has inserted money, tickets, tokens, cards or other mechanism for obtaining credits for plays on the gaming machine through credit mechanisms 14. Using a button panel 16 and/or a touch screen 18, the player may select any variables associated with the wagering game and place his/her wager to purchase a play of the game. In a play of the game, the processor 20 generates at least one random event using a

10 random number generator (RNG) and provides an award to the player for a winning outcome of the random event.

Alternatively, the random event may be generated by a remote computer using an RNG or pooling schema and then transmitted to the gaming machine. The processor 20 operates the display 12 to represent the random event(s) and

15 outcome(s) in a visual form that can be understood by the player. In addition to the processor 20, the control system may include one or more additional slave control units for operating the display 12 and any secondary displays.

System memory 24 stores control software, operational instructions and data associated with the gaming machine. In one embodiment, the system memory 24

20 comprises a separate read-only memory (ROM) and battery-backed random-access memory (RAM). However, it will be appreciated that the system memory 24 may be implemented on any of several alternative types of memory structures or may be implemented on a single memory structure.

A payoff mechanism 26 is operable in response to instructions from the

25 processor 20 to award a payoff to the player. The payoff may, for example, be in the form of a number of credits. The number of credits is determined by one or more math tables stored in the system memory 24.

In one embodiment, gaming machine 10 includes three-dimensional characters. Three dimensional effects have been used in previous gaming machines.

Effects to date have, however, relied on pre-rendered presentations of three-dimensional images. The use of pre-rendered images limited the types of user interaction that could be handled and, therefore, was view as somewhat gimmicky. Gaming machines 10 according to the present invention generate their three-

5   dimensional effects in real-time. The result is a much more interactive and interesting environment for the gaming player.

In one embodiment, the three-dimensional characters are implemented using a game design package such as RenderWare Studio 2.0 running, for example, on a processor designed by Intel or AMD. These characters are used to add excitement

10   to, for example, bonus events.

In one embodiment, a player selects an avatar from player selectable and configurable avatars. In one such embodiment, as shown in Fig. 3, processor 20 displays the character at 30 and the player selects from attributes such as gender, race, dress and facial features at 32. In one embodiment, players are also given the

15   ability to morph the avatar by, for example, elongating, coloring, shading, or twisting facial or body parts. The selected character is then used at 34 to determine a game outcome as a function of movement of the character.

One approach to add excitement to the game is to have player-selected features determine the prizes that are accessible to the player. For example, if they

20   create a tall avatar, it can reach a prize up in a tree, but can't get through a doorway for other prizes. The opposite is true for a short avatar. Player controllable emotional responses. Player can have their avatar show happiness or dismay over the size of an award. Especially important for games with multiple players, or the avatar can be viewed on a more public display (overhead sign).

25   Another approach is to use an avatar's equipment, dress or size as visible representations of wealth. As the player wins during a bonus, the avatar's appearance will reflect the amount. For example, a Robin Hood-type game might use golden helmets or a giant bow to show how successful the player is.

In one embodiment, gaming machine 10 is connected to a network. In such an embodiment, players configure characters through a website for use on a gaming machine. In one such embodiment, each gaming machine 10 is connected to a server; the player's avatar is, therefore, available on any terminal supporting avatar
5 games. Player can configure their avatar from home. In one embodiment, players configure their avatar using their own graphics/sound files.

In one embodiment, gaming machine 10 includes a user interface device that tracks certain user movements. In one such embodiment, the avatar mimics players movements captured, for instance, using a video camera (e.g., Sony's EyeToy).
10 Sony's EyeToy (or equivalent) tracks the players actions to make picks, direct the avatar, dance, etc.

In one embodiment, each avatar has a pet and the actions of the pet effect the game outcome.

In one embodiment, players control an avatar's emotional response. Players
15 can have their avatar show happiness or dismay over the size of an award. Such a capability is especially important for games with multiple players, or the avatar can be viewed on a more public display (overhead sign)

More than one character could be used in a bonus event. In one embodiment, gaming machine 10 allows simultaneous control of multiple characters
20 by a player. The player gives characters goals or tasks to carry out.

In one such embodiment, the player selects the character they wish to control; the game controls the others using, for instance, some form of artificial intelligence. The player's character performs its actions based on player input. The other characters then react to the player's characters and/or make independent
25 actions in order to create a gaming outcome. One such approach is shown in Fig. 4.

In the embodiment shown in Fig. 4, one or more characters are displayed at 40, the characters are moved under user control at 42 and the movement and interaction between characters is used to determine the gaming outcome at 44.

In one embodiment, two or more players interacting in a single scene. In one such embodiment, each player looks on the same scene but controls different characters within that scene. Game play is either cooperative or competitive. Examples of each include building a common tower, or competing at tug-of-war.

5   In one such embodiment, two or more gaming machines 10 are connected over a network. The scene being displayed for each player is shown as a composite scene for the entertainment of people watching the action.

In one embodiment, two or more players interacting in a single scene. In one such approach also creates the possibility of controlling a game outcome as a function of multiple characters attempting to control the same object within a
10   scene, either simultaneously, or by taking turns. Tug-of-war is again an example. Another example is the moving of pieces to solve a puzzle.

In one embodiment, the scene the player sees is enhanced through the use of dynamic camera effects used while tracking the character being controlled by the player. In one such embodiment, the player selects the character to be
15   shown/followed and the camera angle or point of view. Some effects include chase, rubberbanding and overhead shots. In one embodiment, a zoom feature can be used by the player to open a new game (e.g., by allowing the player to introduce a new game by zooming into a little screen).

Excitement can also be added through the use of three-dimensional lighting
20   effects. In one embodiment, an avatar aims a directional lights source (e.g., by aiming a flashlight or a search light). Prizes are revealed by controlling the beam of light to the values. In another embodiment, an avatar holds or manipulates a general light source (e.g. a torch or a fire). Available light limits the players field of view and therefore restricts the pick field.

25   Excitement can also be added by adding real or apparent randomness to character movement. There are a variety of methods available to control how a character moves within a scene, including: pointing to the destination, using button controls, pointing to a series of way points. In one embodiment, key frame interpolation is used to smooth out transitions between character actions.

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In one embodiment, gaming machine 10 includes the ability for players to combine three-dimensional objects into a single object which either shares the attributes of the pieces, and/or creates new attributes.

Texture mapping can also be used to enhance the game experience. In one embodiment, texture mapping is performed in real-time to customize characters for a particular casino location in a realistic way.

In the above discussion, the term "processor" is defined to include any digital or analog data processing unit. Examples include any microprocessor or microcontroller capable of embodying the inventions described herein.

Examples of articles comprising machine readable media are floppy disks, hard drives, CD-ROM or DVD media or any other read-write or read-only memory device.

Portions of the above description have been presented in terms of algorithms and symbolic representations of operations on data bits within a computer memory. These algorithmic descriptions and representations are the ways used by those skilled in the data processing arts to most effectively convey the substance of their work to others skilled in the art. An algorithm is here, and generally, conceived to be a self-consistent sequence of steps leading to a desired result. The steps are those requiring physical manipulations of physical quantities. Usually, though not necessarily, these quantities take the form of electrical or magnetic signals capable of being stored, transferred, combined, compared, and otherwise manipulated. It has proven convenient at times, principally for reasons of common usage, to refer to these signals as bits, values, elements, symbols, characters, terms, numbers, or the like. It should be borne in mind, however, that all of these and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to these quantities. Unless specifically stated otherwise as apparent from the following discussions, terms such as "processing" or "computing" or "calculating" or "determining" or "displaying" or the like, refer to the action and processes of a computer system, or similar computing device, that manipulates and

transforms data represented as physical (e.g., electronic) quantities within the computer system's registers and memories into other data similarly represented as physical quantities within the computer system memories or registers or other such information storage, transmission or display devices.

5   Although specific embodiments have been illustrated and described herein, it will be appreciated by those of ordinary skill in the art that any arrangement which is calculated to achieve the same purpose may be substituted for the specific embodiment shown. This application is intended to cover any adaptations or variations of the present invention. Therefore, it is intended that this invention be

10   limited only by the claims and the equivalents thereof.

Claims

What is claimed is:

5   1.   In a gaming machine that produces a gaming outcome, a method of
performing a bonus event, comprising:
         displaying a three-dimensional character;
         modifying the character based on one or more user selections; and
         controlling the character to influence the gaming outcome.

10

2.   The method of claim 1, wherein the three-dimensional character is generated
in real time.

3.   The method of claim 1, wherein the three-dimensional character is selected

15   from selectable and configurable avatars.

4.   The method of claim 1, wherein the character is modifiable by elongating,
coloring, shading or twisting facial or body parts of the character.

20   5.   The method of claim 1, wherein emotion attributes displayed by the
character are modifiable.

6.   The method of claim 1, wherein characters are modified through a website
for use on the gaming machine.

25

7.   The method of claim 6, wherein the gaming machine is connected to a
server.

8.   The method of claim 7, wherein the character is available on any terminal supporting avatar games.

9.   The method of claim 7, wherein the character is modifiable by a user from the user's home.

10.   The method of claim 1, wherein user movements are tracked by a user interface.

11.   The method of claim 10, wherein the characters mimics user movements.

12.   The method of claim 1, comprising more than one character.

13.   The method of claim 12, comprising simultaneous control of multiple characters.

14.   The method of claim 12, wherein the gaming machine controls some of the characters.

15.   The method of claim 12, wherein the user controls some of the characters.

16.   The method of claim 7, wherein a portion of a composite scene is viewable on a gaming machine.

17.   An article comprising a machine readable medium having instructions thereon, wherein the instructions, when executed in a computer, create a system for executing the method of claim 1.

18.   In a gaming machine that produces a gaming outcome on a display, a method of performing a bonus event, comprising:
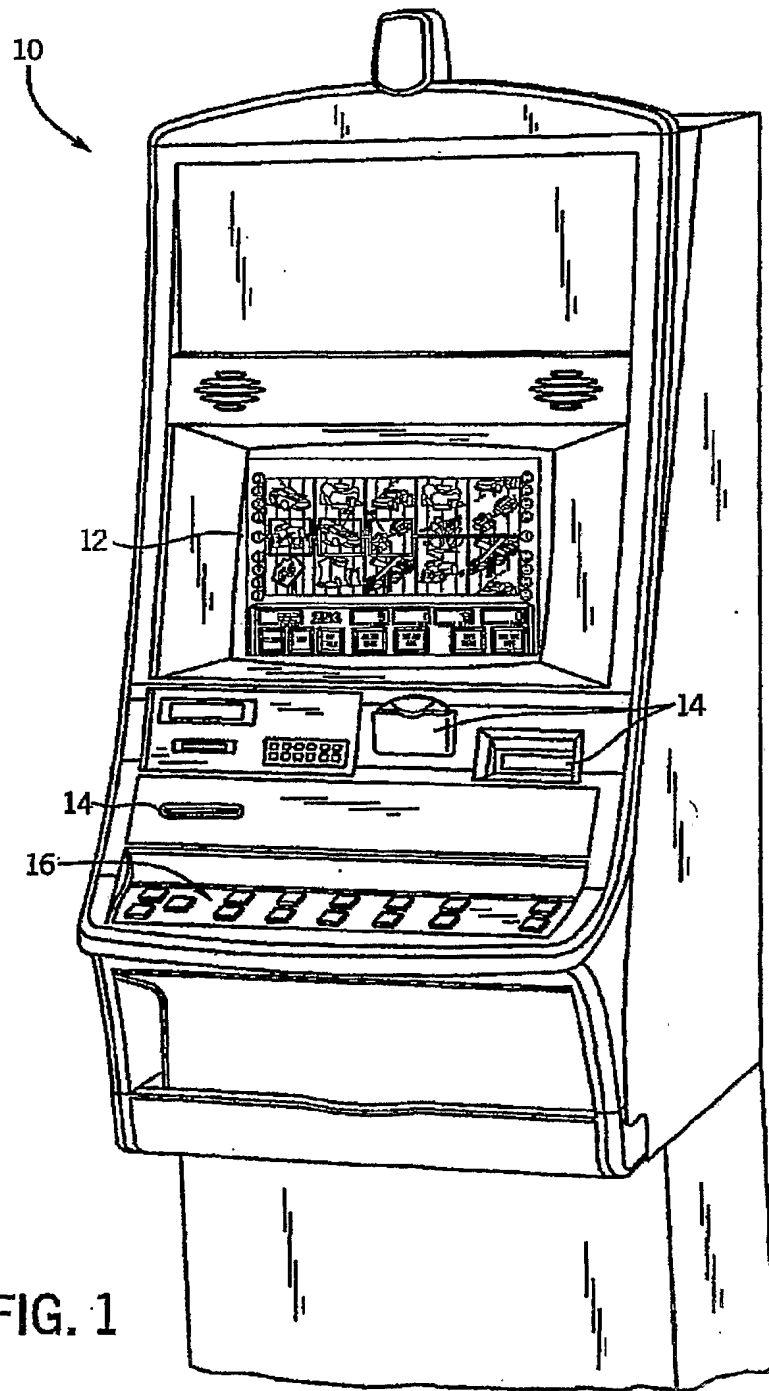
    displaying one or more three-dimensional characters;

    moving one of the characters under player control; and

5   determining the gaming outcome as a function of movement of the character within the display.

19.   An article comprising a machine readable medium having instructions thereon, wherein the instructions, when executed in a computer, create a system for
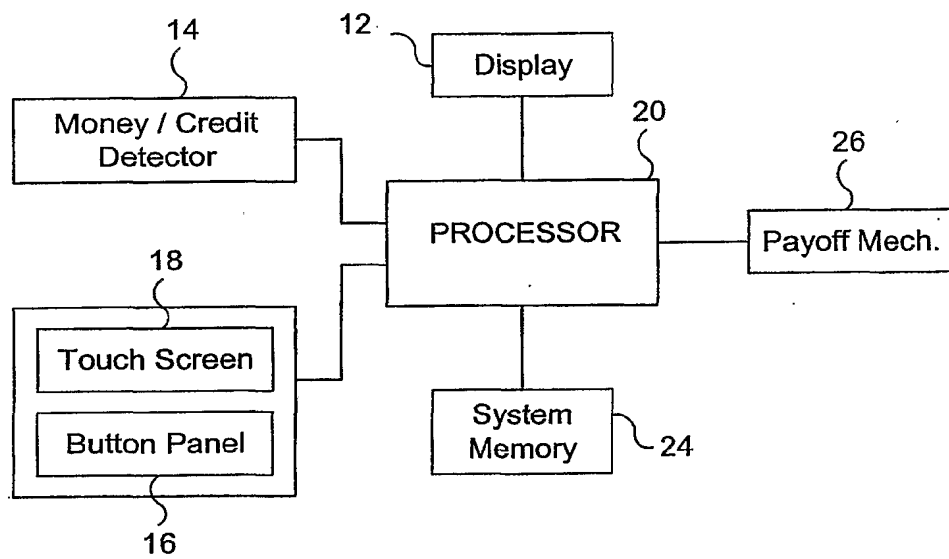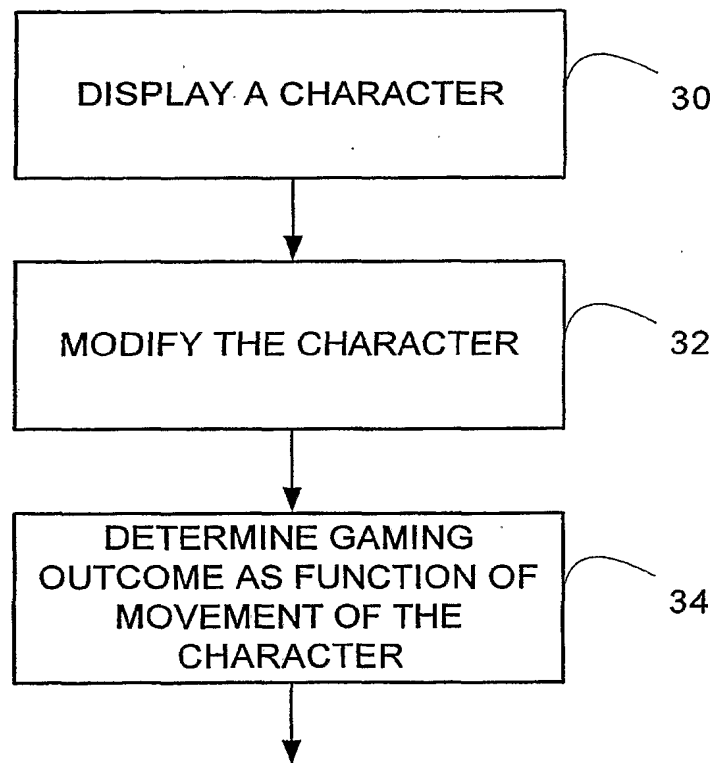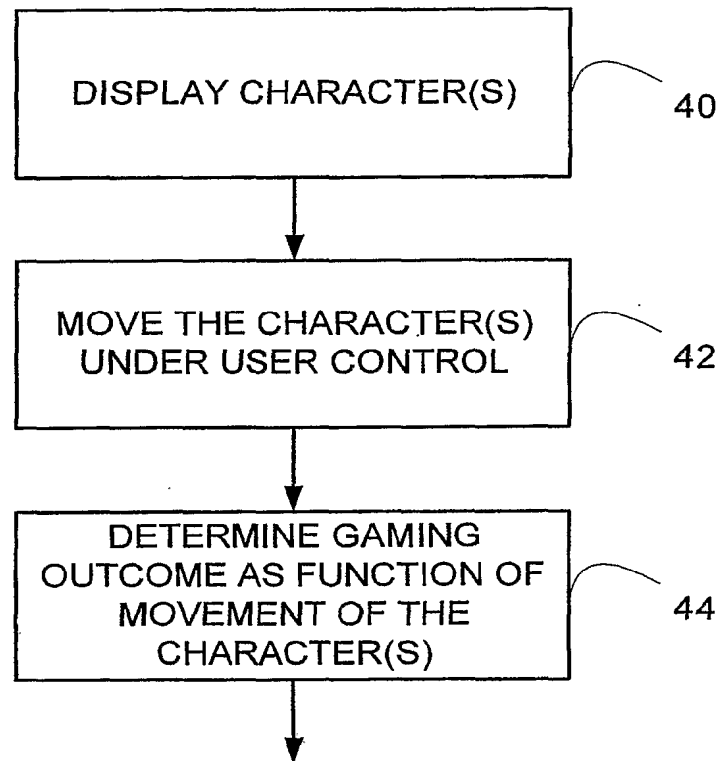10   executing the method of claim 3.

FIG. 1

FIG. 2

DISPLAY A CHARACTER — 30

MODIFY THE CHARACTER — 32

DETERMINE GAMING OUTCOME AS FUNCTION OF MOVEMENT OF THE CHARACTER — 34

FIG. 3

FIG. 4